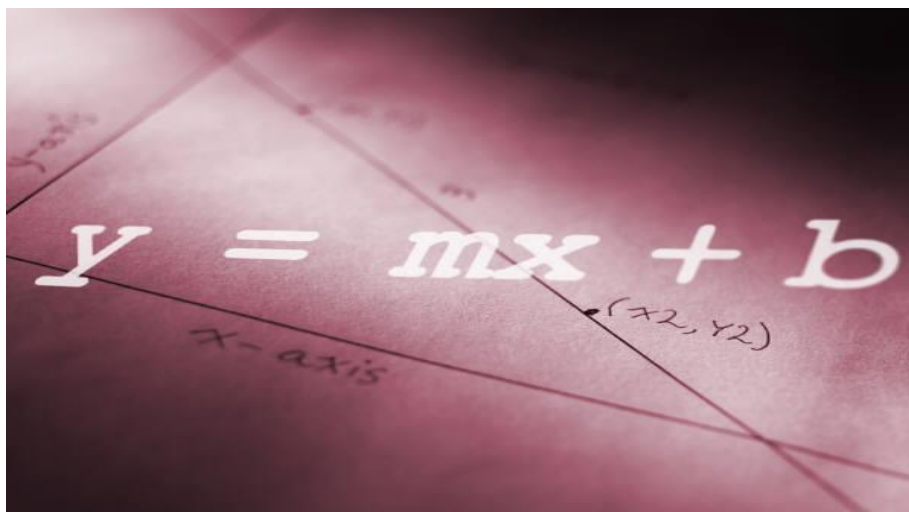


# MOUNT VERNON CITY SCHOOL DISTRICT



“A World Class Organization”

## CCLS Algebra ® Curriculum Guide - NMHZHS



**THIS HANDBOOK IS FOR THE IMPLEMENTATION OF THE CCLS  
ALGEBRA 1 ® CURRICULUM IN MOUNT VERNON.**

**2013-2014**

# Mount Vernon City School District



## Board of Education

Gerald Whiteside  
*President*

Leonard Sarver  
*Vice President*

### Board Trustees

Brenda Crump  
Serigne Gningue  
Elias Steven Gootzeit  
Rosemarie M. Jarosz  
Adriane Saunders  
Michelle Walker  
Frances Wynn

*Interim Superintendent of Schools*  
Judith Johnson

*Assistant Superintendent of Business*  
Timothy Costello

*Assistant Superintendent of Human Resources*  
Hasna Muhammad, Ed.D

*Assistant Superintendent for Innovation, Accountability and Grants*  
Gertrude Karabas

*Administrator of Mathematics and Science (K-12)*  
Satish Jagnandan, Ed.D.

## **TABLE OF CONTENTS**

<b>I.</b>	<b>COVER</b>	<b>1</b>
<b>II.</b>	<b>MVCSD BOARD OF EDUCATION</b>	<b>2</b>
<b>III.</b>	<b>TABLE OF CONTENTS</b>	<b>3</b>
<b>IV.</b>	<b>IMPORTANT DATES</b>	<b>4</b>
<b>V.</b>	<b>VISION STATEMENT</b>	<b>5</b>
<b>VI.</b>	<b>PHILOSOPHY OF MATHEMATICS CURRICULUM</b>	<b>6</b>
<b>VII.</b>	<b>NYS P-12 COMMON CORE LEARNING STANDARDS</b>	<b>7</b>
<b>VII.</b>	<b>MVCSD CCLS ALGEBRA 1 ® PACING GUIDE</b>	<b>11</b>
<b>VIII.</b>	<b>WORD WALL</b>	<b>12</b>
<b>IX.</b>	<b>SETUP OF A MATHEMATICS CLASSROOM</b>	<b>13</b>
<b>X.</b>	<b>SECONDARY GRADING POLICY</b>	<b>14</b>
<b>XI.</b>	<b>SAMPLE NOTEBOOK RUBRIC</b>	<b>15</b>
<b>XII.</b>	<b>CLASSROOM AESTHETICS</b>	<b>16</b>
<b>XIII.</b>	<b>SYSTEMATIC DESIGN OF A MATHEMATICS LESSON</b>	<b>17</b>

*This document was prepared by the Mount Vernon City School District Curriculum and Instruction Department in conjunction with the Mathematics Articulation Committee.*

*Longfellow Middle School – Christopher Pearce*

*AB Davis Middle School – Processo Fajardo*

*Mount Vernon High School – Anderson Jones, Michelle Esterman, Marla Robins*

*Nellie Thornton High School – Peter Palij, Corinn Gorman-Bahr*

*Nelson Mandela High School – Dr. Osmann Joasil, James Campbell*

## **IMPORTANT DATES 2013-14**

### **REPORT CARD – 10 WEEK PERIOD**

<b>MARKING PERIOD</b>	<b>MARKING PERIOD BEGINS</b>	<b>INTERIM PROGRESS REPORTS</b>	<b>MARKING PERIOD ENDS</b>	<b>DURATION/ INSTRUCTIONAL DAYS</b>	<b>REPORT CARD DISTRIBUTION</b>
<b>MP 1</b>	September 9, 2013	October 11, 2013	November 15, 2013	10 weeks / <b>48 Days</b>	Week of Nov. 25, 2013
<b>MP 2</b>	November 18, 2013	December 20, 2013	January 31, 2014	9 weeks / <b>42 Days</b>	Week of February 10, 2014
<b>MP 3</b>	February 3, 2014	March 14, 2014	April 11, 2014	9 weeks / <b>45 Days</b>	Week of April 28, 2014
<b>MP 4</b>	April 21, 2014	May 23, 2014	June 26, 2014	10 weeks / <b>48 Days</b>	Last Day of School June 26, 2014

As per MVCSD Board Resolution 06-71, the **Parent Notification Policy** states “Parent(s) / guardian(s) or adult students are to be notified, *in writing*, at any time during a grading period when it is apparent - that the student may fail or is performing unsatisfactorily in any course or grade level. Parent(s) / guardian(s) are also to be notified, *in writing*, at any time during the grading period when it becomes evident that the student's conduct or effort grades are unsatisfactory.”

## **VISION STATEMENT**

True success comes from co-accountability and co-responsibility. In a coherent instructional system, everyone is responsible for student learning and student achievement. The question we need to constantly ask ourselves is, "How are our students doing?"

The starting point for an accountability system is a set of standards and benchmarks for student achievement. Standards work best when they are well defined and clearly communicated to students, teachers, administrators, and parents. The focus of a standards-based education system is to provide common goals and a shared vision of what it means to be educated. The purposes of a periodic assessment system are to diagnose student learning needs, guide instruction and align professional development at all levels of the system.

The primary purpose of this Instructional Guide is to provide teachers and administrators with a tool for determining what to teach and assess. More specifically, the Instructional Guide provides a "road map" and timeline for teaching and assessing the *Common Core Learning Standards*.

I ask for your support in ensuring that this tool is utilized so students are able to benefit from a standards-based system where curriculum, instruction, and assessment are aligned. In this system, curriculum, instruction, and assessment are tightly interwoven to support student learning and ensure **ALL** students have equal access to a rigorous curriculum.

We must all accept responsibility for closing the achievement gap and improving student achievement for all of our students.

Satish Jagnandan, Ed.D

Administrator for Mathematics and Science (K-12)

## **PHILOSOPHY OF MATHEMATICS CURRICULUM**

The Mount Vernon City School District recognizes that the understanding of mathematics is necessary for students to compete in today's technological society. A developmentally appropriate mathematics curriculum will incorporate a strong conceptual knowledge of mathematics through the use of concrete experiences. To assist students in the understanding and application of mathematical concepts, the mathematics curriculum will provide learning experiences which promote communication, reasoning, and problem solving skills. Students will be better able to develop an understanding for the power of mathematics in our world today.

Students will only become successful in mathematics if they see mathematics as a whole, not as isolated skills and facts. As we develop mathematics curriculum based upon the standards, attention must be given to both content and process strands. Likewise, as teachers develop their instructional plans and their assessment techniques, they also must give attention to the integration of process and content. To do otherwise would produce students who have temporary knowledge and who are unable to apply mathematics in realistic settings. Curriculum, instruction, and assessment are intricately related and must be designed with this in mind. All three domains must address conceptual understanding, procedural fluency, and problem solving. If this is accomplished, school districts will produce students who will

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

# New York State P-12 Common Core Learning Standards for Mathematics

## Mathematics - High School Algebra: Introduction

### Expressions.

An expression is a record of a computation with numbers, symbols that represent numbers, arithmetic operations, exponentiation, and, at more advanced levels, the operation of evaluating a function. Conventions about the use of parentheses and the order of operations assure that each expression is unambiguous. Creating an expression that describes a computation involving a general quantity requires the ability to express the computation in general terms, abstracting from specific instances.

Reading an expression with comprehension involves analysis of its underlying structure. This may suggest a different but equivalent way of writing the expression that exhibits some different aspect of its meaning. For example,  $p + 0.05p$  can be interpreted as the addition of a 5% tax to a price  $p$ . Rewriting  $p + 0.05p$  as  $1.05p$  shows that adding a tax is the same as multiplying the price by a constant factor.

Algebraic manipulations are governed by the properties of operations and exponents, and the conventions of algebraic notation. At times, an expression is the result of applying operations to simpler expressions. For example,  $p + 0.05p$  is the sum of the simpler expressions  $p$  and  $0.05p$ . Viewing an expression as the result of operation on simpler expressions can sometimes clarify its underlying structure.

A spreadsheet or a computer algebra system (CAS) can be used to experiment with algebraic expressions, perform complicated algebraic manipulations, and understand how algebraic manipulations behave.

### Equations and inequalities.

An equation is a statement of equality between two expressions, often viewed as a question asking for which values of the variables the expressions on either side are in fact equal. These values are the solutions to the equation. An identity, in contrast, is true for all values of the variables; identities are often developed by rewriting an expression in an equivalent form.

The solutions of an equation in one variable form a set of numbers; the solutions of an equation in two variables form a set of ordered pairs of numbers, which can be plotted in the coordinate plane. Two or more equations and/or inequalities form a system. A solution for such a system must satisfy every equation and inequality in the system.

An equation can often be solved by successively deducing from it one or more simpler equations. For example, one can add the same constant to both sides without changing the solutions, but squaring both sides might lead to extraneous solutions. Strategic competence in solving includes looking ahead for productive manipulations and anticipating the nature and number of solutions.

Some equations have no solutions in a given number system, but have a solution in a larger system. For example, the solution of  $x + 1 = 0$  is an integer, not a whole number; the solution of  $2x + 1 = 0$  is a rational number, not an integer; the solutions of  $x^2 - 2 = 0$  are real numbers, not rational numbers; and the solutions of  $x^2 + 2 = 0$  are complex numbers, not real numbers.

The same solution techniques used to solve equations can be used to rearrange formulas. For example, the formula for the area of a trapezoid,  $A = ((b_1 + b_2)/2)h$ , can be solved for  $h$  using the same deductive process.

Inequalities can be solved by reasoning about the properties of inequality. Many, but not all, of the properties of equality continue to hold for inequalities and can be useful in solving them.

### Connections to Functions and Modeling.

Expressions can define functions, and equivalent expressions define the same function. Asking when two functions have the same value for the same input leads to an equation; graphing the two functions allows for finding approximate solutions of the equation. Converting a verbal description to an equation, inequality, or system of these is an essential skill in modeling.

## Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

## Algebra Overview

### Seeing Structure in Expressions

- Interpret the structure of expressions
- Write expressions in equivalent forms to solve problems

### Arithmetic with Polynomials and Rational Expressions

- Perform arithmetic operations on polynomials
- Understand the relationship between zeros and factors of polynomials
- Use polynomial identities to solve problems
- Rewrite rational expressions

### Creating Equations

- Create equations that describe numbers or relationships

### Reasoning with Equations and Inequalities

- Understand solving equations as a process of reasoning and explain the reasoning
- Solve equations and inequalities in one variable
- Solve systems of equations
- Represent and solve equations and inequalities graphically

## Seeing Structure in Expressions

A-SSE

### *Interpret the structure of expressions.*

1. Interpret expressions that represent a quantity in terms of its context.★
  - a. Interpret parts of an expression, such as terms, factors, and coefficients.
  - b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret  $P(1+r)^n$  as the product of  $P$  and a factor not depending on  $P$ .*
2. Use the structure of an expression to identify ways to rewrite it. *For example, see  $x^4 - y^4$  as  $(x^2)^2 - (y^2)^2$ , thus recognizing it as a difference of squares that can be factored as  $(x^2 - y^2)(x^2 + y^2)$ .*

### *Write expressions in equivalent forms to solve problems.*

3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★
  - a. Factor a quadratic expression to reveal the zeros of the function it defines.
  - b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
  - c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression  $1.15^t$  can be rewritten as  $(1.15^{1/12})^{12t} \approx 1.012^{12t}$  to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*
4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*★



**Arithmetic with Polynomials & Rational Expressions****A-APR*****Perform arithmetic operations on polynomials.***

1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

***Understand the relationship between zeros and factors of polynomials.***

2. Know and apply the Remainder Theorem: For a polynomial  $p(x)$  and a number  $a$ , the remainder on division by  $x - a$  is  $p(a)$ , so  $p(a) = 0$  if and only if  $(x - a)$  is a factor of  $p(x)$ .
3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

***Use polynomial identities to solve problems.***

4. Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity  $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$  can be used to generate Pythagorean triples.*
5. (+) Know and apply the Binomial Theorem for the expansion of  $(x + y)^n$  in powers of  $x$  and  $y$  for a positive integer  $n$ , where  $x$  and  $y$  are any numbers, with coefficients determined for example by Pascal's Triangle.<sup>1</sup>

***Rewrite rational expressions.***

6. Rewrite simple rational expressions in different forms; write  $\frac{a(x)}{b(x)}$  in the form  $q(x) + \frac{r(x)}{b(x)}$ , where  $a(x)$ ,  $b(x)$ ,  $q(x)$ , and  $r(x)$  are polynomials with the degree of  $r(x)$  less than the degree of  $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.
7. (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

<sup>1</sup>The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.

**Creating Equations****A-CED*****Create equations that describe numbers or relationships.***

1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law  $V = IR$  to highlight resistance  $R$ .*

**Reasoning with Equations & Inequalities****A-REI*****Understand solving equations as a process of reasoning and explain the reasoning.***

1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

***Solve equations and inequalities in one variable.***

3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
4. Solve quadratic equations in one variable.

- a. Use the method of completing the square to transform any quadratic equation in  $x$  into an equation of the form  $(x - p)^2 = q$  that has the same solutions. Derive the quadratic formula from this form.
- b. Solve quadratic equations by inspection (e.g., for  $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as  $a \pm bi$  for real numbers  $a$  and  $b$ .

***Solve systems of equations.***

5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line  $y = -3x$  and the circle  $x^2 + y^2 = 3$ .
8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension  $3 \times 3$  or greater).

***Represent and solve equations and inequalities graphically.***

10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
11. Explain why the  $x$ -coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where  $f(x)$  and/or  $g(x)$  are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★
12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

## **CCLS ALGEBRA 1 ® PACING GUIDE**

This guide using *NYS CCLS Algebra 1 Modules* was created to provide teachers with a time frame to complete the New York State Mathematics Algebra 1 Curriculum.

<b>Module</b>	<b>Unit Title</b>	<b>Standards</b>	<b>Days</b>	<b>Month</b>	<b>Workbook Lessons</b>
<b>1</b>	Relationships Between Quantities and Reasoning with Equations and Their Graphs	N-Q.1, N-Q.2, N-Q.3, A-SSE.1a, A-SSE.1b, A.SSE.2, A-APR.1 A-CED.1, A-CED.2, A-CED.3, A-CED.4, A-REI.1, A-REI.3, A-REI.5, A-REI.6, A-REI.10, A-REI.12	20	Feb 3– Mar. 7	1 - 9
<b>2</b>	Descriptive Statistics	S-ID.1, S-ID.2, S-ID.3, S-ID.5, S-ID.6, S-ID.6a, S-ID.6b, S-ID.6c, S-ID.7, S-ID.8, S-ID.9	13	Mar. 10 – Mar. 27	24 - 30
<b>3</b>	Linear and Exponential Functions	A-REI.11 A.SSE.3c A.CED.1 F-BF.1a F-IF.1, F-IF.2, F-IF.3, F-IF.4, F-IF.5, F-IF.6, F-IF.7a, F-IF.9, F-BF.3, F-LE.1, F-LE.1a, F-LE.1b, F-LE.1c, F-LE.2, F-LE.3, F-LE.5	17	Mar. 28 – Apr. 28	10 - 23

Module	Unit Title	Standards	Days	Month	Workbook Lessons
4	Polynomial and Quadratic Expressions, Equations and Functions	N-RN.3, A-SSE.1, A-SSE.1a, A-SSE.1b, A-SSE.1a, A-SSE.1b, A-SSE.2, A-SSE.3, A-SSE.3a, A-SSE.3b A-SSE.3b A-APR.1, A-APR.3, A-CED.1, A-CED.2, A-REI.4, A-REI.4a, A-REI.4b, A-REI.11 F-BF.3 F-IF.4, F-IF.5, F-IF.6, F-IF.7a, F-IF.7b, F-IF.8a, F-IF.9	15	Apr. 29 – May 19	31 - 36
5	A Synthesis of Modeling with Equations and Functions	N-Q.2, N-Q.3, A-CED.1, A-CED.2 F-IF.4, F-IF.5, F-IF.6, , F-BF.1a, F-BF.3, F-LE.1, F-LE.1b, F-LE.1c, F-LE.2	10	May 20 – June 2	37 - 43
<b>CCLS ALGEBRA 1 REGENTS: JUNE 3, 2014</b>					

Note that the curriculum assumes that each school day includes 75 minutes of math: one hour on the day's Session, and 10-15 minutes on **Fluency activities**. Although pacing will vary somewhat in response to variations in school calendars, needs of students, your school's years of experience with the curriculum, and other local factors, following the suggested pacing and sequence will ensure that students benefit from the way mathematical ideas are introduced, developed, and revisited across the year.

## **WORD WALLS ARE DESIGNED ...**

- to promote group learning
- support the teaching of important general
- principles about words and how they work
- Foster reading and writing in content area
- Provide reference support for children during their reading and writing
- Promote independence on the part of young students as they work with words
- Provide a visual map to help children remember connections between words and the characteristics that will help them form categories
- Develop a growing core of words that become part of their vocabulary

### **Important Notice**

- A Mathematics Word Wall must be present in every mathematics classroom.
- The Suggested List of Mathematical Language for Grade 7 level instruction must be incorporated into the Mathematics Word Wall.

## **Math Word Wall**



- Create a math word wall
- Place math words on your current word wall but highlight them in some way.

## **SETUP OF THE MATHEMATICS CLASSROOM**

### **I. Prerequisites for a Mathematics Classroom**

- Teacher Schedule
- Class List
- Seating Chart
- Code of Conduct / Discipline
- Grade Level Common Core Learning Standards (CCLS)
- Updated Mathematics Student Work
- Mathematics Grading Policy
- Mathematics Diagrams, Charts, Posters, etc.
- Grade Level Number Line
- Grade Level Mathematics Word Wall
- Mathematics Portfolios
- Mathematics Center with Manipulatives (Grades K - 12)

### **II. Updated Student Work**

A section of the classroom must display *recent student work*. This can be of any type of assessment, graphic organizer, and writing activity. Teacher feedback must be included on student's work.

### **III. Board Set-Up**

Every day, teachers must display the **CCLS, Aim, Do Now and Homework**. At the start of the class, students are to copy this information and immediately begin on the **Do Now**.

<b>Student's Name:</b>	<b>School:</b>
<b>Teacher's Name:</b>	<b>Date:</b>
<b>Aim #:</b>	
<b>CCLS:</b>	
<b>Do Now:</b>	

### **IV. Spiraling Homework**

Homework is used to reinforce daily learning objectives. The secondary purpose of homework is to reinforce objectives learned *earlier in the year*. The assessments are **cumulative**, spiraling homework requires students to review coursework throughout the year.

## **SECONDARY MATHEMATICS GRADING POLICY**

This course of study includes different components, each of which are assigned the following percentages to comprise a final grade. I want you--the student--to *understand that your grades are not something that I give you, but rather, a reflection of the work that you give to me.*

### **COMPONENTS**

- |   |          |            |
|---|----------|------------|
| <b>1. Common Assessments</b>              | <b>→</b> | <b>35%</b> |
| <b>2. Quizzes</b>                         | <b>→</b> | <b>20%</b> |
| <b>3. Homework</b>                        | <b>→</b> | <b>20%</b> |
| <b>4. Notebook and/or Journal</b>         | <b>→</b> | <b>10%</b> |
| <b>5. Classwork / Class Participation</b> | <b>→</b> | <b>15%</b> |

- *Class participation will play a significant part in the determination of your grade. Class participation will include the following: attendance, punctuality to class, contributions to the instructional process, effort, contributions during small group activities and attentiveness in class.*

### **Important Notice**

As per MVCSD Board Resolution 06-71, the **Parent Notification Policy** states “Parent(s) / guardian(s) or adult students are to be notified, *in writing*, at any time during a grading period when it is apparent - that the student may fail or is performing unsatisfactorily in any course or grade level. Parent(s) / guardian(s) are also to be notified, *in writing*, at any time during the grading period when it becomes evident that the student's conduct or effort grades are unsatisfactory.”

## **SAMPLE NOTEBOOK SCORING RUBRIC**

<b>Student Name:</b>			<b>Teacher Name:</b>		
Criteria	4	3	2	1	Points
<b>Completion of Required Sections</b>	All required sections are complete.	One required section is missing.	Two or three required sections are missing.	More than three required sections are missing.	
<b>Missing Sections</b>	No sections of the notebook are missing.	One sections of the notebook is missing.	Two sections of the notebook are missing.	Three or more sections of the notebook are missing.	
<b>Headers / Footers</b>	No required header(s) and/or footer(s) are missing within notebook.	One or two required header(s) and/or footer(s) are missing within notebook.	Three or four required header(s) and/or footer(s) are missing within notebook.	More than four required header(s) and/or footer(s) are missing within notebook.	
<b>Organization</b>	All assignment and/or notes are kept in a logical or numerical sequence.	One or two assignments and/or notes are not in a logical or numerical sequence.	Three or Four assignments and/or notes are not in a logical or numerical sequence.	More than four assignments and/or notes are not in a logical or numerical sequence.	
<b>Neatness</b>	Overall notebook is kept very neat.	Overall notebook is kept in a satisfactory condition.	Overall notebook is kept in a below satisfactory condition.	Overall notebook is unkept and very disorganized.	
<b>Total</b>					
<b>Teacher's Comments:</b>					



## CLASSROOM AESTHETICS

### “PRINT-RICH” ENVIRONMENT CONDUCTIVE TO LEARNING

TEACHER NAME: \_\_\_\_\_

COURSE / PERIOD: \_\_\_\_\_

ROOM: \_\_\_\_\_

#### CHECKLIST

	<u>YES</u>	<u>NO</u>
• Teacher Schedule	<input type="checkbox"/>	<input type="checkbox"/>
• Class List	<input type="checkbox"/>	<input type="checkbox"/>
• Seating Chart	<input type="checkbox"/>	<input type="checkbox"/>
• Code of Conduct / Discipline	<input type="checkbox"/>	<input type="checkbox"/>
• Grade Level Mathematics CCLS	<input type="checkbox"/>	<input type="checkbox"/>
• Mathematics Grading Policy	<input type="checkbox"/>	<input type="checkbox"/>
• Mathematics Diagrams, Posters, Displays, etc.	<input type="checkbox"/>	<input type="checkbox"/>
• Grade Level Number Line	<input type="checkbox"/>	<input type="checkbox"/>
• <u>Updated</u> Student Work (Projects, Assessments, Writing, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
• <u>Updated</u> Student Portfolios	<input type="checkbox"/>	<input type="checkbox"/>
• <u>Updated</u> Grade Level Mathematics Word-Wall	<input type="checkbox"/>	<input type="checkbox"/>
• Mathematics Centers with Manipulatives	<input type="checkbox"/>	<input type="checkbox"/>
• Organization of Materials	<input type="checkbox"/>	<input type="checkbox"/>
• Cleanliness	<input type="checkbox"/>	<input type="checkbox"/>

Principal Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Asst. Pri. Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# **SYSTEMATIC DESIGN OF A MATHEMATICS LESSON**

**What are the components of 75-minute Secondary Mathematics Block?**

<b>Standards-Based Mathematics Lesson Plan Format Using the Workshop Model</b>	
<b>Component</b>	<b>Time</b>
<b>AIM: Goal of the Day</b> <ul style="list-style-type: none"> <li>• Written in Question Form</li> <li>• Concept to be Learned</li> <li>• Linked to Closure of the lesson</li> <li>• Written in student friendly language</li> <li>• Can be elicited from the students</li> </ul>	-
<b>Learning Objective(s): Standards-Based</b> <ul style="list-style-type: none"> <li>• A precise way of stating an outcome or goal (refer to Bloom's Taxonomy)</li> <li>• Describes what a student should be able to do ( a road map)</li> <li>• Can be measured for achievability (attainable)</li> <li>• Getting started activities serve as prerequisite skills in preparation for undertaking new objectives</li> </ul>	-
<b>Key Idea(s): NYS Performance Standards</b> <ul style="list-style-type: none"> <li>• Identify the mathematics in the lesson (i.e. area of polygons, use of mathematical language)</li> <li>• Specific skills and concepts students should master</li> </ul>	-
<b>Key Words: Interactive Word Wall</b> <ul style="list-style-type: none"> <li>• Identify, define words relevant to the lesson, topic, concept, skill</li> <li>• Operational definitions of terms, concepts</li> <li>• Use of roots and prefixes for literary understanding</li> <li>• Display on the <i>Math Word Wall</i> and use for vocabulary development</li> </ul>	-
<b>Materials: Creative and Varied</b> <ul style="list-style-type: none"> <li>• Items needed to facilitate the implementation of the lesson</li> <li>• Use to enhance/differentiate lesson (i.e. teacher-made, manipulatives, text, calculators, technology)</li> <li>• Organized and accessible to students</li> </ul>	-
<b>Problem of the Day / Do Now: Opening - Whole Group</b> <ul style="list-style-type: none"> <li>• This can be considered the motivation or Do Now of the lesson</li> <li>• It should set the stage for the day's lesson</li> <li>• Skills review</li> <li>• Introduction of a new concept, built on prior knowledge</li> <li>• Open-ended problems</li> </ul>	<b>5-10 min</b>
<b>Mini Lesson: Guided Practice - Whole Group (Teacher Directed, Student Centered)</b> <ul style="list-style-type: none"> <li>• Inform students of what they are going to do. Refer to Objectives. Refer to the Key Words (Word Wall)</li> <li>• Define the expectations for the work to be done</li> <li>• Provide various demonstrations using modeling and multiple representations (i.e. model a strategy and your thinking for problem solving, model how to use a ruler to measure items, model how to use inch graph paper to find the perimeter of a polygon,)</li> <li>• Relate to previous work</li> <li>• Provide logical sequence and clear explanations</li> <li>• Provide medial summary</li> </ul>	<b>15 – 20 min</b>

<b>Standards-Based Mathematics Lesson Plan Format Using the Workshop Model</b>	
<b>Component</b>	<b>Time</b>
<b>Exploration/Investigation: Independent Practice</b> - Cooperative Groups, Pairs, Individuals, (Student Interaction & Engagement, Teacher Facilitated) <ul style="list-style-type: none"> <li>Students try out the skill or concept learned in the mini-lesson</li> <li>Teachers circulate the room, conferences with the students and assesses student work (i.e. teacher asks questions to raise the level of student thinking)</li> <li>Students construct knowledge around the key idea or content standard through the use of problem solving strategies, manipulatives, accountable/quality talk, writing, modeling, technology applied learning</li> </ul>	<b>25 – 30 min</b>
<b>Share Out: Reflective Practice</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Students discuss their work and explain their thinking</li> <li>Teacher asks questions to help students draw conclusions and make references</li> </ul>	<b>10 – 15 min</b>
<b>Journal Writing: Independent Reflections</b> - Individuals (Teacher Facilitated, Student Centered) <ul style="list-style-type: none"> <li>Reflect thinking in writing</li> <li>Use writing "prompts" if needed (i.e. "I tried to solve this problem by _____ but it did not work because _____.")</li> <li>Answer question (i.e. What did I do in Math today?, What math words did I learn or review? What math did I learn or review?)</li> <li>Pose creative assignments (i.e. Use tangrams to create a character. Give a description and details about your character.)</li> </ul>	<b>5 – 10 min</b>
<b>Final Summary: (Closing)</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Determine if aim/objective(s) were achieved</li> <li>Students summarize what was learned</li> <li>Allow students to reflect, share (i.e. read from journal)</li> <li>Homework is a follow-up to the lesson which may involve skill practice, problem solving and writing</li> </ul>	<b>5 – 10 min</b>
<b>Homework/Enrichment</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Homework is a follow-up to the lesson which may involve skill practice, problem solving and writing</li> <li>Homework, projects or enrichment activities should be assigned on a daily basis.</li> <li><i>SPIRALLING OF HOMEWORK</i> - Teacher will also assign problems / questions pertaining to lessons taught in the past</li> </ul>	<b>-</b>

**Remember: Assessments are on-going based on students' responses.**

<b>Assessment: Independent Practice (It is on-going! Provide formal assessment when necessary / appropriate)</b> <ul style="list-style-type: none"> <li>Always write, use and allow students to generate <i>Effective Questions</i> for optimal learning</li> <li>Based on assessment(s), <i>Re-teach</i> the skill, concept or content using alternative strategies and approaches</li> </ul>	
--	--

# **SYSTEMATIC DESIGN OF A MATHEMATICS LESSON**

## **What are the components of a 40-Minute Secondary Mathematics Lesson?**

<b>Standards-Based Mathematics Lesson Plan Format Using the Workshop Model</b>	
<b>Component</b>	<b>Time</b>
<b>AIM: Goal of the Day</b> <ul style="list-style-type: none"> <li>• Written in Question Form</li> <li>• Concept to be Learned</li> <li>• Linked to Closure of the lesson</li> <li>• Written in student friendly language</li> <li>• Can be elicited from the students</li> </ul>	-
<b>Learning Objective(s): Standards-Based</b> <ul style="list-style-type: none"> <li>• A precise way of stating an outcome or goal (refer to Bloom's Taxonomy)</li> <li>• Describes what a student should be able to do ( a road map)</li> <li>• Can be measured for achievability (attainable)</li> <li>• Getting started activities serve as prerequisite skills in preparation for undertaking new objectives</li> </ul>	-
<b>Key Idea(s): NYS Performance Standards</b> <ul style="list-style-type: none"> <li>• Identify the mathematics in the lesson (i.e. area of polygons, use of mathematical language)</li> <li>• Specific skills and concepts students should master</li> </ul>	-
<b>Key Words: Interactive Word Wall</b> <ul style="list-style-type: none"> <li>• Identify, define words relevant to the lesson, topic, concept, skill</li> <li>• Operational definitions of terms, concepts</li> <li>• Use of roots and prefixes for literary understanding</li> <li>• Display on the <i>Math Word Wall</i> and use for vocabulary development</li> </ul>	-
<b>Materials: Creative and Varied</b> <ul style="list-style-type: none"> <li>• Items needed to facilitate the implementation of the lesson</li> <li>• Use to enhance/differentiate lesson (i.e. teacher-made, manipulatives, text, calculators, technology)</li> <li>• Organized and accessible to students</li> </ul>	-
<b>Problem of the Day / Do Now: Opening - Whole Group</b> <ul style="list-style-type: none"> <li>• This can be considered the motivation or Do Now of the lesson</li> <li>• It should set the stage for the day's lesson</li> <li>• Skills review</li> <li>• Introduction of a new concept, built on prior knowledge</li> <li>• Open-ended problems</li> </ul>	<b>5 min</b>
<b>Mini Lesson: Guided Practice - Whole Group (Teacher Directed, Student Centered)</b> <ul style="list-style-type: none"> <li>• Inform students of what they are going to do. Refer to Objectives. Refer to the Key Words (Word Wall)</li> <li>• Define the expectations for the work to be done</li> <li>• Provide various demonstrations using modeling and multiple representations (i.e. model a strategy and your thinking for problem solving, model how to use a ruler to measure items, model how to use inch graph paper to find the perimeter of a polygon,)</li> <li>• Relate to previous work</li> <li>• Provide logical sequence and clear explanations</li> <li>• Provide medial summary</li> </ul>	<b>10 – 15 min</b>

<b>Standards-Based Mathematics Lesson Plan Format Using the Workshop Model</b>	
<b>Component</b>	<b>Time</b>
<b>Exploration/Investigation: Independent Practice</b> - Cooperative Groups, Pairs, Individuals, (Student Interaction & Engagement, Teacher Facilitated) <ul style="list-style-type: none"> <li>Students try out the skill or concept learned in the mini-lesson</li> <li>Teachers circulate the room, conferences with the students and assesses student work (i.e. teacher asks questions to raise the level of student thinking)</li> <li>Students construct knowledge around the key idea or content standard through the use of problem solving strategies, manipulatives, accountable/quality talk, writing, modeling, technology applied learning</li> </ul>	<b>20 – 25 min</b>
<b>Share Out: Reflective Practice</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Students discuss their work and explain their thinking</li> <li>Teacher asks questions to help students draw conclusions and make references</li> </ul>	<b>5 – 10 min</b>
<b>Journal Writing: Independent Reflections</b> - Individuals (Teacher Facilitated, Student Centered) <ul style="list-style-type: none"> <li>Reflect thinking in writing</li> <li>Use writing "prompts" if needed (i.e. "I tried to solve this problem by _____ but it did not work because _____.")</li> <li>Answer question (i.e. What did I do in Math today?, What math words did I learn or review? What math did I learn or review?)</li> <li>Pose creative assignments (i.e. Use tangrams to create a character. Give a description and details about your character.)</li> </ul>	<b>5 – 10 min</b>
<b>Final Summary: (Closing)</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Determine if aim/objective(s) were achieved</li> <li>Students summarize what was learned</li> <li>Allow students to reflect, share (i.e. read from journal)</li> <li>Homework is a follow-up to the lesson which may involve skill practice, problem solving and writing</li> </ul>	<b>5 min</b>
<b>Homework/Enrichment</b> - Whole Group (Teacher Directed, Student Centered) <ul style="list-style-type: none"> <li>Homework is a follow-up to the lesson which may involve skill practice, problem solving and writing</li> <li>Homework, projects or enrichment activities should be assigned on a daily basis.</li> <li><i>SPIRALLING OF HOMEWORK</i> - Teacher will also assign problems / questions pertaining to lessons taught in the past</li> </ul>	<b>-</b>

**Remember: Assessments are on-going based on students' responses.**

<b>Assessment: Independent Practice (It is on-going! Provide formal assessment when necessary / appropriate)</b> <ul style="list-style-type: none"> <li>Always write, use and allow students to generate <i>Effective Questions</i> for optimal learning</li> <li>Based on assessment(s), <i>Re-teach</i> the skill, concept or content using alternative strategies and approaches</li> </ul>	
--	--

### **Important Notice**

- Writing assignments at the end of the lesson (closure) bring great benefits. Not only do they enhance students' general writing ability, but they also increase both the understanding of content while learning the specific vocabulary of the disciplines.
- **Spiraling Homework**
  - o Homework is used to reinforce daily learning objectives. The secondary purpose of homework is to reinforce objectives learned *earlier in the year*. The assessments are **cumulative**, spiraling homework requires students to review coursework throughout the year.
- Manipulative must be incorporated in all lessons. With students actively involved in manipulating materials, interest in mathematics will be aroused. Using manipulative materials in teaching mathematics will help students learn:
  - a. to relate real world situations to mathematics symbolism.
  - b. to work together cooperatively in solving problems.
  - c. to discuss mathematical ideas and concepts.
  - d. to verbalize their mathematics thinking.
  - e. to make presentations in front of a large group.
  - f. that there are many different ways to solve problems.
  - g. that mathematics problems can be symbolized in many different ways.
  - h. that they can solve mathematics problems without just following teachers' directions.